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(54) Queue management system.

(57) There is provided a queue management system comprising a dispensing means (1) for dispensing to a customer a queue-position indication, a main display means (2) for displaying information in relation to the service position at the head of the queue, "slave" customer display units (3) and individual remote control units (4) and a master remote control unit (5). The queue-position indication on the display means (2) is remotely controllable. A processing unit may be provided to process data received from the remote control units (4, 5) and dispensing means (2) to enable the system to be monitored.

## QUEUE MANAGEMENT SYSTEM

The present invention relates to a queue management system suitable for use in controlling the serving order of customers at, for instance, a supermarket counter, or the like. The system might also be employed in pharmacy prescription dispensaries, hospital and doctor's surgeries, cafes, restaurants and canteens although the present invention should not be construed as being limited for use in any of the above. The queue management system of the present invention may be used at any location where people have to wait for any form of goods or service.

Queue management systems are well known in many situations, in particular at supermarket counters. The systems currently in use employ inter-connecting wiring between a staff-operated signalling device and a customer display unit.

According to one aspect of the present invention there is provided a queue management system comprising:

means actuatable on arrival of a customer at a service point;

a display means for displaying an indication relating to a customer being served;

at least one remote control unit linked to the display means and capable of causing an indication displayed by the display means to be updated; and a processing unit adapted to process data received from the actuatable means and the display means and to provide information to enable the system to be monitored.

According to a second aspect of the present invention, there is provided a queue management system comprising:

means actuatable on arrival of a customer at a service point;

a display means for displaying an indication relating to a customer being served; and

at least one remote control unit linked to the display means and capable of causing information displayed by the display means to be updated;

wherein the link between the or each remote control unit and the display means is "wireless" and comprises a receiver/transmitter arrangement.

The means actuatable on arrival of a customer at a service point is preferably a dispensing means for dispensing to a customer on arrival at a service point an indication of their relative position in any queue at the service point. The dispensing means may be a ticket dispenser, for example in the form of a printer. The dispenser is capable of being actuated by a customer, for instance by operation of a button, to cause the printer to issue a numbered ticket providing the customer with an indication of his/her queue position. It is to be appre-

ciated that the indication of queue position need not be a number but could be some other recognisable character which would enable the customer to determine his/her queue position, for instance a letter, or combination of letters, of the alphabet. At present, it is preferred that the queue-position indication is a number which is sequentially updated for each new customer arriving at the dispenser.

Alternatively, the actuatable means may be actuatable by a customer (either directly or indirectly) without dispensing a ticket. For example, the customer might enter (or have entered on their behalf) an identification such as his/her name which is then displayed on the display means when it is that person's turn to be served. The actuatable means might be actuatable by, for example, something on the person of the customer, such as a magnetic card or transmitter of some description.

The display means may be a conventional display unit having the capacity to display a character or series of characters indicative of the queue-position being served at the head of the queue. Typically, the displayed indication will be the number of the ticket of the customer who has last been called for serving. This enables other customers waiting to determine the number of people in the queue ahead of them. It is within the scope of the present invention that the display unit displays other information in relation to the status of the queue. For example, it may merely identify the customer actually being called for serving.

Other display units may be provided as "slave" units on the main customer display. Alternatively, or in addition, other remote display units could be provided at separate locations, for instance in a manager's office. Such additional, or "slave" units, could be connected to the main unit or could be updated directly by a signal from one of the control units. The system may include means for indicating a change in the information displayed. For example, the display may temporarily change colour, or a display change may be accompanied by a chime. Typically, the display means will be operated from the mains supply although it may include a battery-backed count memory to avoid loss of information should the mains power be interrupted.

The or each remote control unit preferably includes a single button which causes a signal to be sent to the display means to advance the display unit by one step (i.e. one digit if the display is a numeral). The signal may be transmitted to the display unit by conventional means, such as via a wire link. Alternatively, the arrangement may be "wireless" with the link being constituted by a

transmitter on the remote control unit and a receiver on the display unit. The signal, in this embodiment, may be an infra-red signal or any other form of electro-magnetic wave, for example a radio or ultrasonic signal.

The main display means may be adapted to send signals to other remote displays, either via a "wireless" arrangement similar to that described above or a conventional wire link. Alternatively, secondary display units may be operated directly by a signal from the or each remote control unit.

In the embodiment in which the remote control units are "wireless", each may be powered by a battery for ease of handling. It is to be appreciated, however, that the remote control unit may be powered from the mains supply.

In addition to the remote control units for operation by serving staff, there may also be provided a master remote control unit capable of being operated by, for instance, a manager or supervisor. This master remote control unit would be substantially the same as the standard remote control units for operation by sales staff but might include three separate buttons: a first button for advancing the count by one step on the display (without any time delay between advances); a second button for a fast advance of the display; and a third button to reset the display or displays to zero. As with the standard remote control units, the master remote control unit may be rechargeable, standard battery powered, or may be powered from the mains supply.

The processing unit is adapted to process data received from one or more of the dispensing means, the remote control unit(s) and the display means. In many applications the most important data for the processing unit to collect in order to enable monitoring of the system are the time and number of each queue-position indication issued and the time of serving of each sequential position at the head of the queue. This data would allow the processing system to provide information as to the time taken to serve customers during the day, variations in the length of the queue during the day, the rate at which tickets are issued and a simple tally of the number of customers served on each day. Moreover, this arrangement would enable a remote indication of a large build-up of customers to be detected and this might allow the manager temporarily to allocate extra staff to clear the backlog of customers.

Conveniently, the processing unit may be contained together in a single unit with the dispensing means which controls the dispensing of queue-position indications. The processing unit may collect data on the time at which each queue-position is served directly from the remote control unit or via a transmission from the display unit.

For a better understanding of the present invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawing which illustrates schematically a queue management system in accordance with the present invention.

The queue management system shown in the figure comprises a dispensing means 1 for dispensing to a customer a queue-position indication, a main display means 2 for displaying information in relation to the service position at the head of the queue, "slave" customer display units 3, three remote control units 4 and a master remote control unit 5.

The dispensing means 1 comprises a printer and processing means. On operation of a button or the like by a customer, the printer issues a ticket. The tickets 6 issued by the printer 1 are preferably numbered sequentially. The customer display 2 includes a display panel 7 on which the number of the ticket currently being served is displayed. The slave displays 3 also display the number being served. The display unit is powered from the mains 8.

Each remote control unit includes a button 9 which a member of serving staff operates when it is desired to update the number on the display unit 2. This will normally be after each customer has been served. The display means 2 includes control circuiting which prevents too rapid an advance of the numbers displayed in order that each number will be displayed for long enough to be noticed by the customers, even if the control units are operated twice within a short space of time. For example, once the display has advanced once, any further advance is inhibited for, say, 30 seconds. The unit may also include a repeater display 20 to inform the staff operator of the customer to be served next. Thus, the display means transmits the current ticket or serving number to the remote control units for the benefit of the operating staff. Also, to ensure that customers are alerted when the display changes, each change may be accompanied by an audible chime, and the display may temporarily change colour. Communication between the remote control unit 9 and the display 2 is by a "wireless" system in the illustrated embodiment, employing an infra-red link. Thus, each control unit includes an infra-red transmitter and the main display means 2 a receiver. The display means 2 may also include a transmitter for transmitting an indication of the number of the ticket currently being displayed to the dispensing means 2 which also functions as the central processing unit.

The master control unit 5 includes three buttons 10, 11 and 12, which enable the following action to be taken: advancing the counter on the

display unit by one digit, fast advance of display numbers on the display unit and resetting the display unit to zero. The master control unit 5 may be battery or mains powered.

In the embodiment illustrated, the ticket dispensing means 1 is housed together with the processing means which processes data received from one or more of the dispensing means, the remote control units and the display unit. Thus, the processing unit collects information from the dispensing means 1 as to the time a customer takes a ticket together with the ticket number. The processing means also collects information as to the time at which the display means 2 is updated in response to a signal from a remote control unit 4. By collating and processing the data, information can be provided on, for instance, the following: the time taken to serve customers during the day, variations in the length of the queue, the rate at which tickets are issued and also a simple tally of the number of customers served on each day.

#### Claims

1. A queue management system comprising:  
means actuatable on arrival of a customer at a service point;

a display means for displaying an indication relating to a customer being served;

at least one remote control unit linked to the display means and capable of causing an indication displayed by the display means to be updated; and  
a processing unit adapted to process data received from the actuatable means and the display means and to provide information to enable the system to be monitored.

2. A queue management system comprising:  
means actuatable on arrival of a customer at a service point;

a display means for displaying an indication relating to a customer being served; and

at least one remote control unit linked to the display means and capable of causing information displayed by the display means to be updated;

wherein the link between the or each remote control unit and the display means is "wireless" and comprises a receiver/transmitter arrangement.

3. A queue management system according to claim 1 or 2, wherein the means actuatable on arrival of a customer is a dispensing means for dispensing to a customer an indication of their relative position in any queue at the service point.

4. A queue management system according to claim 3, wherein the dispensing means is a ticket dispenser.

5. A queue management system according to claim 4, wherein the dispensing means is a ticket dispenser in the form of a printer.

6. A queue management system according to claim 5, wherein the dispenser is capable of being actuated by a customer to cause the printer to issue a numbered ticket providing the customer with an indication of queue position.

7. A queue management system according to claim 6, wherein the queue-position indication is a number which is sequentially updated for each new customer arriving at the dispenser.

8. A queue management system according to claim 1 or 2, wherein the actuatable means is actuatable by a customer without dispensing a ticket.

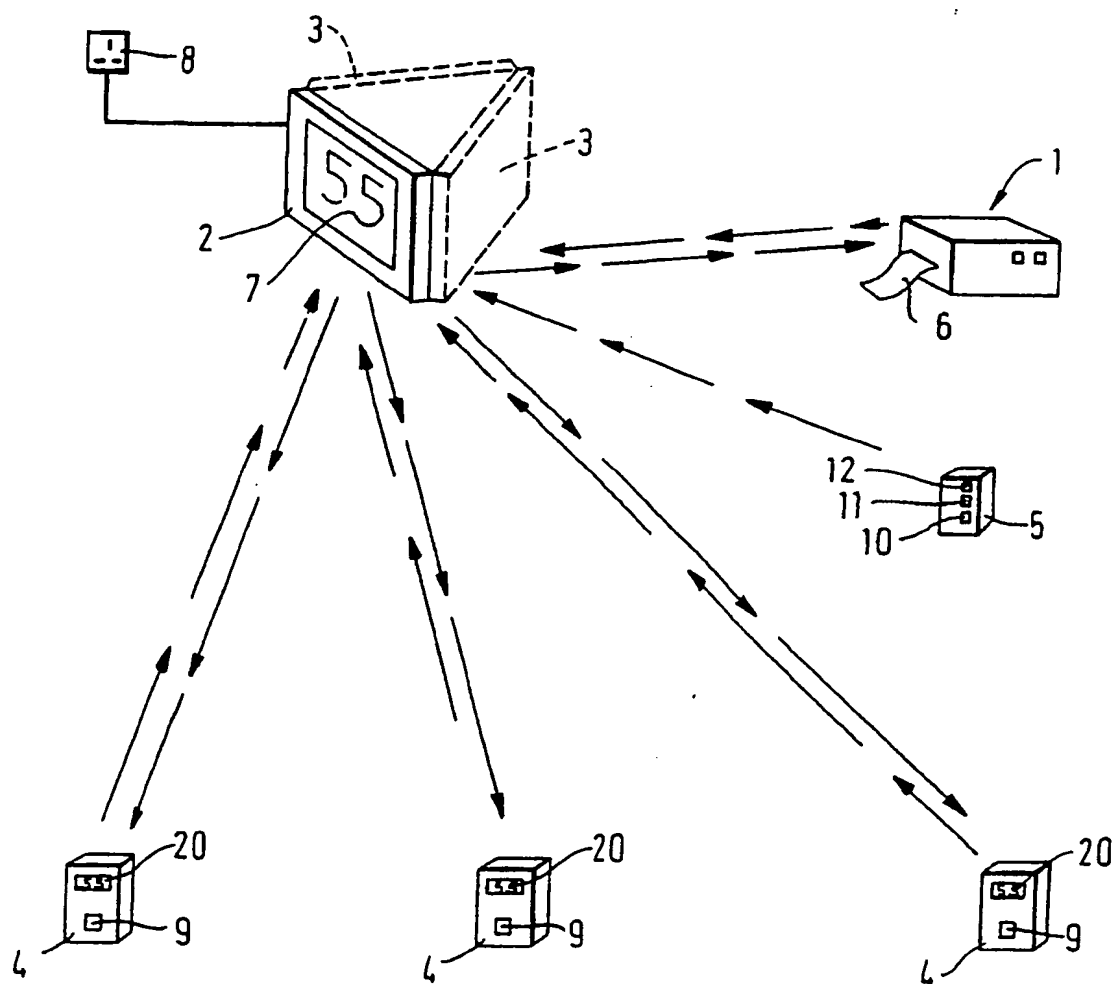
9. A queue management system according to claim 1 or 2, wherein the display means is a display unit having the capacity to display a character or series of characters indicative of the queue-position being served at the head of the queue.

10. A queue management system according to claim 2, wherein the signal between the receiver and transmitter is in the form of an electro-magnetic wave.

11. A queue management system according to claim 10, wherein the signal is an infra-red signal.

12. A queue management system according to claim 1, wherein the processing unit is adapted to process data received from one or more of the dispensing means, the remote control unit(s) and the display means.

13. A queue management system according to claim 12, wherein the processing unit is capable of collecting data to enable monitoring of the system.





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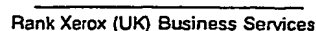
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⑤④ Queue management system.

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## EUROPEAN SEARCH REPORT

Application Number

EP 90 31 0385

### DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X,Y	PATENT ABSTRACTS OF JAPAN vol. 7, no. 282 (P-243)(1427) December 16, 1983 & JP-A-58 158 760 (AUTO STAMP KENKYUSHO ) September 21, 1983 * the whole document * - - -	1,3-7,9, 12,11,13	G 07 C 11/00
X,Y	PATENT ABSTRACTS OF JAPAN vol. 7, no. 42 (P-177)(1187) February 19, 1983 & JP-A-57 191 780 (TATEISHI DENKI ) November 25, 1982 * the whole document * - - -	1,2,9,10, 8,11	
X,A	WO-A-8 300 399 (PETTERSSON) * page 1, line 15 - page 3, column 25 * * page 8, line 6 - page 9, column 37; figures * - - -	1,3,4,7,9, 12,13,2,5, 6,8	
Y	GB-A-2 162 349 (ADAPTACOM) * page 2, line 78 - line 103; claims 1-13; figures * - - -	8,13	
A	US-A-4 575 707 (IMAZEKI) - - -		
A	WO-A-8 202 972 (NCR) - - - - -		TECHNICAL FIELDS SEARCHED (Int. Cl.5)
The present search report has been drawn up for all claims			G 07 C G 08 B
Place of search		Date of completion of search	Examiner
The Hague		03 October 91	MEYL D.
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